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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/550,429	09/21/2005	Matthias Fink	28944/50001	3337

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EXAMINER	
HUGHES, SCOTT A	

ART UNIT	PAPER NUMBER
3663	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/550,429	FINK ET AL.	
	Examiner	Art Unit	
	SCOTT A. HUGHES	3663	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 April 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *25 July 2007* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments filed 4/9/2008 have been fully considered but they are not persuasive.

Applicant argues that Hossack does not disclose using the impulse responses as alleged in the rejection in the prior Office Action, except in an indirect way by the fact that a signal is transmitted between the emission and reception points. This argument is not persuasive because Hossack, as noted by applicant, has a signal transmitted between emission and reception points. Hossack was not cited as teaching the claimed step of "determining the impulse response." The Sallas reference was relied on to teach that an impulse response can be determined from signals between emission and reception points. Sallas teaches that this gives the benefit of determining the properties of the medium between the emitters and receivers, and it would have been obvious to modify Hossack to include this determination of impulse responses in order to determine properties of the material (See Office Action mailed 10/9/2007, Page 4).

Applicant further argues that Hossack does not disclose emitting signals at frequencies f0 + k δf. This argument is not persuasive because Hossack discloses each transmitter i emitting at 3, 5 and 7 MHz (3 is f0, 5 is 3 + 2(1Mz), 7 is 3 + 4(1MHz). Applicant's arguments with respect to the frequencies being orthogonal coded signals are not persuasive because the claim language does not state that there is orthogonal coding. The claim language is limited to the frequencies emitted, and not to whether or not the emitted frequencies are orthogonally coded.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., orthogonal coding) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Applicant's arguments that Sallas does not teach acquiring a whole set of impulse responses in one sweep are not persuasive. Sallas was not cited as teaching acquiring a whole set of impulse responses in one sweep. Hossack teaches emission and reception between multiple points in one sweep, and Sallas teaches that this emission and reception can be used to determine impulse response.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-2, 5-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hossack (5696737) in view of Sallas (5721710)

With regard to claim 1, Hossack discloses responses of a medium in relation to the transmission of waves between different points (Column 1, Line 55 to Column 2, Line 27; Column 3, Lines 10-60; Column 12, Line 45 to Column 14, Line 56). Hossack discloses: (a) at least one step of emission in the course of which waves are emitted

into the medium by generating signals ei(t) on the basis of a number N of emission points included in the medium, where N is an integer at least equal to 2 and i is an index lying between 1 and N which designates one of said N emission points (each transducer in array 16) (Fig. 1), (b) at least one step of reception in the course of which signals rj(t) are picked up from said waves after transmission in said medium, at a number M of reception points included in the medium, where M is a non-zero natural integer and j is an index lying between 1 and M which designates one of said M reception points (transducers in array 16 when used to receive signals) (Column 3), (c) and using responses hij(t) between each emission point i and each reception point j on the basis of the signals emitted ei(t) and picked up rj(t) (Column 1, Line 55 to Column 2, Line 27; Column 3, Lines 10-60; Column 12, Line 45 to Column 14, Line 56). Hossack discloses that during the course of step (a), said N emission points are made to simultaneously emit the signals ei(t), these signals ei(t) having a duration T and each being a sum of n substantially monochromatic elementary signals, of like amplitude and of respective frequencies f.sub.0,i+k..delta.f, where f.sub.0,i is a predetermined eigenfrequency (harmonic) at the point i, k is an integer lying between 0 and n, n is an integer at least equal to 2 and .delta.f is a predetermined frequency interval, the respective eigenfrequencies f.sub.0,i at the various points i being distinct and lying in a frequency band of width .delta.f, and using an impulse response filter on the signal ei(t) emitted at the point i and the signal rj(t) picked up at the point j (Column 1, Line 55 to Column 2, Line 27; Column 3, Lines 10-60; Columns 4-10 dealing with transmission of frequencies from transducers; Column 12, Line 45 to Column 14, Line 56) (Figs. 7-10, 16-20).

Hossack does not specifically disclose calculating the impulse response from the waves emitted and received in the medium. Sallas teaches transmitting and receiving acoustic signals to determine properties of a structure being imaged, and teaches determination of impulse responses hij(t) between emission points i and each reception points j on the basis of the signals emitted ei(t) and picked up rj(t), wherein each impulse response hij(t) is calculated on the basis of a signal of correlation between the signal ei(t) emitted at the point i and the signal rj(t) picked up at the point j (Column 4, Line 35 to Column 5, Line 15; Column 6, Line 62 to Column 7, Line 44; Column 9, Line 49 to Column 10, Line 67; Column 15, lines 14-25; Column 19). It would have been obvious to modify Hossack to include calculating the impulse response of the medium from the correlation of the received and transmitted waveforms as taught by Sallas in order to determine the properties of the medium so that the frequency range needed to image the medium can be optimized.

With regard to claim 2, Hossack discloses that the respective eigenfrequencies f.sub.0,i at the various points i are separated pairwise by an offset .delta.f/N (Columns 4-6) (Figs. 7-10, 16-20).

With regard to claim 5, Hossack discloses that the waves transmitted in the medium between the emission points and the reception points are acoustic waves (abstract; Columns 1,3,12).

With regard to claim 6, Hossack discloses that in the course of step (a), the medium where the waves are emitted is reverberant (Columns 1-3).

With regard to claim 7, Hossack discloses that the frequency interval .delta.f is less than or equal to 1/.tau., where .tau. is the temporal dispersion of the medium (Columns 4-6) (Figs. 7-10, 16-20).

With regard to claim 8, Hossack discloses that the frequency interval .delta.f is substantially equal to 1/.tau., where .tau. is the temporal dispersion of the medium (Columns 4-6) (Figs. 7-10, 16-20).

With regard to claim 9, Hossack discloses that the duration T is at least equal to N/.delta.f (Columns 4-6) (Figs. 7-10, 16-20).

With regard to claim 10, Hossack discloses that the duration T is at least equal to N..tau., where .tau. is the temporal dispersion of the medium (Columns 4-6) (Figs. 7-10, 16-20).

With regard to claim 11, Hossack discloses that the elementary signals exhibit random phases (Column 4, Lines 1-20). Hossack discloses that the phases can have errors, and therefore they are random.

With regard to claim 12, Hossack discloses that the waves are emitted with a certain passband, the frequencies f0i comprise a minimum frequency f0 and the number n is determined so that the frequency band lying between f0 and f0+[(n+1)..delta.f] substantially overlaps said passband (Column 1, Line 55 to Column 2, Line 27; Column 3, Lines 10-60; Columns 4-10 dealing with transmission of frequencies from transducers; Column 12, Line 45 to Column 14, Line 56) (Figs. 7-10, 16-20)..

With regard to claim 13, Hossack discloses the method as claimed in claim 1, in which the reception points are coincident with the emission points (transducers 16) (Fig.1).

Claims 3-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hossack (5696737) in view of Sallas (5721710) as applied to claim 1 above, and further in view of Panasik (IEEE July 1976).

With regards to claims 3-4, Hossack and Sallas do not disclose the specifics of calculating the impulse response using a gate function. Panasik teaches that it is known to use a gate function when calculating impulse response (245-246). It would have been obvious to modify Hossack and Sallas to include using a gate function in order to minimize data by windowing the data. From the disclosure of Sallas and Panasik (239-246), applicant's equations for determining impulse response appear to be the normal mathematical calculations required to determine impulse response.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SCOTT A. HUGHES whose telephone number is (571)272-6983. The examiner can normally be reached on M-F 9:00am to 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Keith can be reached on (571) 272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/S. A. H./
Examiner, Art Unit 3663

/Jack W. Keith/
Supervisory Patent Examiner, Art Unit 3663